DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

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Working Paper AEE/8/2000

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ABSTRACT

Conduct of agents in the Northern Malawi tobacco market channel

This study is based on the Industrial Organisation (IO) theory to analyse the behaviour of farmers and firms and the economic performance and how it changes over time. This model posits that there are basic conditions that determine the market structure, which in turn determines the conduct of farmers and organisations involved in the tobacco industry.

There are over 10 000 growers and 200 intermediate tobacco buyers, who are structurally organised so as to not compete against each other. Both the growers and the intermediate buyers must eventually sell all their tobacco at the Mzuzu auction floor to four tobacco dealers who collude in price determination. These tobacco dealers in turn supply processed tobacco to four cigarette manufacturers, who appear to have significant power in influencing prices at the auction floors at prices dictated by the manufacturers. This behaviour of the tobacco dealers confirms the existence of an oligopsonistic market at the dealer stage of the channel.

The existence of an auction floor does not necessarily imply free competition between dealers. Evidence suggests the conduct of the dealers is one of a leader/follower model on the auction floors. The largest dealer is able to dictate optimum prices offered and volumes to be purchased on any one day of sale that will maximize profits for all the dealers. Furthermore the tobacco organisations have strong enough lobbying powers to reduce competition at the intermediate buyer level and to protect their members to a certain degree.

On the basis of the research findings the study recommends policies that will empower the growers and promote competition between the intermediate buyers. Policies that reduce collusion and encourage competition between dealers on the auction floor are recommended to break up the oligopsonistic market structure. A follow-up study is needed to determine how efficient the auction floor system is elsewhere and how collusion is regulated and competition promoted.

1. INTRODUCTION

The Agricultural Development and Marketing Co-operation (ADMARC) introduced burley tobacco in the Northern Region of Malawi, in 1971, as a potential cash crop in the smallholder farming sector. Burley plantings expanded considerably from 170 hectares to 9509 hectares from 1991 to 1998, while yields increased from 1200 to 1306 kilograms per hectare over the same period. Burley production increased dramatically from 204 tons to 12 417 tons over the same period (Msiska, 1998). This rapid growth in area planted, yield and output resulted from government guaranteed prices, input subsidies and easy access to markets.

In 1994 the Malawi government liberalised the tobacco market and removed the tobacco buying monopoly held by ADMARC and the tobacco supply monopoly held by estates in the growing of tobacco. This resulted in the entry of new buyers and smallholder growers into the market. Despite this increase in the number of buyers which in theory, can be expected to increase competition and improve prices received by farmers, tobacco growers have complained that they are receiving "unfair" prices from the buyers. This is because farmers have a lack of bargaining power when negotiating prices for their produce. For example from 1997 to 1998, the Malawi Kwacha devalued from MK15.29 to MK25.04 to one American dollar (TEAM, 1998), but the farm gate price of tobacco has only improved from MK10.07 (TAMA, 1997) to MK11.50 (TAMA, 1998) per kilogram of first grade tobacco.

These poor prices would encourage many farmers to grow traditional crops such as maize, rather than tobacco. However, growing maize will not create sufficient cash income to ensure that there is adequate access to food for the family throughout the year. Ng'ong'ola (1995), realised that the low tobacco prices would promote maize production and effectively reduce maize prices as supply exceeded demand. His main concern was that no policies were being passed that would provide the necessary auction floor training for growers and that would improve competition on the auction floor. The abscence of such policies has created an oligopsonistic tobacco market in Malawi, where a few dealers at the floors and certain tobacco related organizations are able to determine prices (Sant'ana, 1999).

This paper is based on the Structure-Conduct-Performance analysis carried out in Northern Malawi by Sant'ana (1999). It will only focus on the behaviour of participants in the Malawi tobacco channel. The aim of this paper is that of contributing to literature aimed at illustrating important areas to be considered by policy researchers and policy makers. This is especially important, given that Malawi has implemented a policy for the complete liberalization of the tobacco industry. By exposing oligopsonistic competition, decision makers will be able to reason and understand the prevailing needs in the tobacco trade.

2. RESEARCH OBJECTIVES

The overall objective of the research is to investigate the conduct of the various agents in the tobacco market and to identify institutional and organisational innovations with the potential to empower intermediate buyers and farmers involved in the tobacco industry in Northern Malawi. The specific objectives are:

1. To identify how prices are determined on the auction floors,
2. To determine the behaviour of the dealers on the auction floor,
3. To determine farm-gate price and buyer behaviour,
4. To determine the behaviour of tobacco growers, and
5. To determine how the behaviour of tobacco related organizations affects the participants in the tobacco industry.

3. LITERATURE REVIEW

Sant'ana (1999) identified three main types of growers in Malawi: estates; smallholders; and tenants. The estates are large holdings, operate with credit and services facilities, and employ a large labour force. Smallholders produce a small amount of tobacco as a second crop, use family labour, and have access to small land holdings and limited input and transport facilities. Tenants work for the estate owners who provide all the inputs and purchase the final crop from them.

All three growers are serviced with inputs purchased from retailers in all the district centres, throughout the country. Smallholder have access to input loans, organized by the National Smallholder Farmers Association of Malawi (NASFAM). The estates buy inputs directly from retailers. In addition, estates obtain input loans from the Tobacco Association of Malawi (TAMA). Tenants, on the other hand, obtain inputs on credit from their estate owners. This means access to inputs is not limiting throughout most of Malawi.

All farmers utilise the same processing functions of harvesting leaves when they turn pale green, drying them in barns to a preferred colour, storing, grading and baling tobacco for sale. Thus growers compete freely at the production stage.

There are three auction floors in Malawi: Mzuzu, Lilongwe and Limbe. Lilongwe is the largest selling over 50% of the countries tobacco (Sant'ana, 1999). The main tobacco dealers have their factories in Lilongwe and Limbe. As such all tobacco bought in Mzuzu must go to the nearest factories in Lilongwe for processing and export to the cigarette manufacturers.

In the Northern Region, tobacco is a relatively new crop. Survey data using the Chi-squared test at a 5% significance revealed that 52% of the estates in Bolhero have been functioning for six to ten years, while 69.2% the small-holders for less than five years (Sant'ana, 1999). Smallholders are new and inexperienced tobacco growers. However their average yield is at 1108.28 kilogram per hectare, compared to the 1071.72 kilogram per hectare produced by the estates (Sant'ana, 1999). Analysis of the data indicated that 68% of the smallholders grow between 1.1ha and 3.0 hectare of tobacco, while 70% of estates grow three to twelve hectares of tobacco (Sant'ana, 1999).

Until 1996-1997, all tobacco had to be sold directly to Auction Holdings Limited (AHL) or to the Agricultural Development and Marketing Co-operation (ADMARC). ADMARC's role was that of an intermediate buyer for those farmers who did not have the means by which to sell directly to AHL. Tobacco was bought at the Tobacco Association of Malawi (TAMA) proposed prices and then sold on the auction floor by ADMARC (Sant'ana, 1999). The absence of a competitive market and pricing system at this level prompted the introduction of Intermediate Buyers Licence. The licence holder was granted permission to purchase tobacco from farmers and later sell it on the floors, thus creating competition for ADMARC and forcing prices to raise, so benefiting the farmers. However in the Northern Region the buyers are buying at the TAMA prices, due to the abscence of competition in this sector.

Survey datum collected by Sant'ana,(1999) show that tobacco channels are appropriate to the farmer type to a significance of 5%, using a Chi-squared test. Although 87% of the estates only use the floors, there are those which need to sell tobacco quickly to purchase food for tenants or inputs (8.7%). This is done through sales directly to intermediate buyers. Thirty-four percent of the smallholders are utilising the intermediate buyer for acquisition of cash early in to the season (Sant'ana, 1999). All growers tend to sell their low grade tobacco to the intermediate buyers, reserving the better leaves for the auction floors.

The intermediate buyer will purchase by grade and kilogram, while at the floors sales are by grades in stipulated weights. Once floors open, all buyers tend to sell directly to the floors. Tenants are meant to sell only to the estate owners. However Sant'ana, (1999) found that 25% of the tenant farmers sell to the intermediate buyers in order to acquire cash for the purchase of food and basic necessities for their families.

Until 1998, the buyers were charged MK0.25 per kilogram of tobacco purchased (Sant'ana, 1999). This inevitably led to a large number of participants' (843). The impact was found to be negative for estate growers, since most tenants were now selling estate tobacco illegally to buyers. As a result the Tobacco Association of Malawi (TAMA) lobbied for a law that would limit the number of buyers. In the 1999 season the charges were increased to MK2.00 per kilogram purchased. This resulted in the number of buyers dropping to 202 and the expected buyer quota falling drastically from five million in 1998 to one hundred thousand in 1999 (Sant'ana, 1999). Furthermore the Tobacco Control Commission (TCC) began to allocate tobacco buying areas to the intermediate buyers. Thus confining buyers to specified locations. As a result TAMA had successfully protected estate owners by limiting the intermediate buyer development, through a reduction of competition between buyers.

The opening of the Mzuzu floors in 1996, was a great welcome for growers, as previously they had to send their tobacco to Lilongwe for sale (Sant'ana, 1999). Unfortunately with the new floor, there are still delays and prices are lower than they are at the Lilongwe floors. The Mzuzu auction floor is only utilized by four dealers: Limbe leaf, Stancom, Daimon and African leaf. A tobacco dealer company is contracted by a cigarette manufacturer to procure, process and transport green tobacco from the source to the factory. Once purchased, the bales are transported to their processing factories, where the tobacco is prepared according to manufacturer specifications.

The same four dealers in Mzuzu also buy on the other floors in Malawi. In the recent past the floors throughout Malawi serviced over 10 buyers. However: i) the international move against smoking, ii) the high tax charges on Malawi tobacco exports, iii) the high international taxes in tobacco sales, iv) the high capitol investments needed, and v) the competitive nature of the tobacco business has encouraged merging of all those dealers previously operating. As a result there are now only four buyers in Mzuzu and Lilongwe (Sant'ana, 1999). Limbe leaf has always been known as the largest buyer in Malawi purchasing 50% to 60% of the entire tobacco crop in Malawi followed by Stancom and Daimon with 21% and 20% respectfully. African Leaf being the smallest has 6% of the market.

Sant'ana (1999), calculated the concentration ratio and Herfindahl index to determine if an oligopsonistic competition exists at the tobacco auction floors. He found the concentration ratio to be approaching 0, and the Herfindahl index increasing towards 1. These values indicates that the market favours Limbe leaf and that an oligopsonistic market exists.

Sant'ana (1999), identified numerous organizations that existed in Malawi to facilitate tobacco

marketing for the numerous market participants. The Tobacco Association of Malawi (TAMA) was founded in 1929. Its membership includes all estate growers, producer clubs, companies, syndicates and buyers who are registered with TCC. TAMA objective is to develop the Tobacco industry in Malawi and to advance and protect the interests of all growers through co-operation with government and other associations having similar interests.

The Smallholder Agribusiness Development Program (SADP) was formed in pilot areas, with the sole purpose of empowering smallholders through club and associations. The idea was to access inputs, loans, extension and marketing of tobacco growers. Through the SADP project, various small farmers organisations went on to form the National Smallholder Farmer Association of Malawi (NASFAM) in 1997. The association is open, free and diverse, with 100% ownership and control in the hands of the member organisations that actively participate in the affairs and operations of the NASFAM. The major objective is to improve the economic and social conditions of the smallholder by providing linkages with beneficial public and private sector service providers and by improving business, financial and marketing management capabilities of smallholder member organisations.

The Malawi Tobacco Exporters Association (TEAM) was formally established in 1930. TEAM represents all buyers of tobacco on the auction floors and is the body responsible for the discussion with representatives of TAMA should problems of concern arise between the two parties. Originally membership was restricted to tobacco buyers and exporters but as the industry developed, processing organisations and manufacturers subsequently became eligible for membership. TEAM has an elected representative on each of the following bodies: TCC, AHL sales committee, ARET and the Malawi Export Promotion Council. It therefore plays a significant role in the tobacco market.

The Tobacco Control Commission (TCC) is a statutory body established in 1938, under the control of the Tobacco Auction Floors Act of Parliament (TCC, 1993). TCC is a controlling body for tobacco production and marketing. It advises government on the sale and export of tobacco, promotes and expands the sale of tobacco and controls the production and sale of tobacco on the Auction Floors in Malawi. TCC issues the grower registration certificates and intermediate buyer permits that allow the above groups to sell directly at the auction floors.

Olney (1998), presented a follow up survey for the United States Agency for International Development (USAID) on the liberalisation of the burley market and the impact it has on the smallholder farmer. He found that direct sales to the auction floors meant that farmers received the

maximum prices in Malawi. However there was a high risk of slow cash flow. For those farmers who sold to ADMARC or to intermediate buyers, the advantage is that weak clubs and individual farmers had a safety net and quick access to cash when needed. Unfortunately the price paid is low and quiet often below expences incurred.

4. ANALYTICAL FRAMEWORK

This study uses the Industrial Organisation (IO) theory to determine the behaviour of farmers and firms. Such a methodology is the standard tool for the analysis of markets in the United States and the United Kingdom (Kohls and Uhl, 1990).The study will focus on the participant conduct only. Market conduct refers to the pattern of behaviour that firms follow in adapting or adjusting to the markets, in which they buy and sell (Pomeroy and Trinidade, 1998). It will include the methods employed by firms in determining prices and output, market channels activities, tobacco organisation behaviour and dealer conglomerate behaviour.

Participant conduct will be determined by the analysis of auction and farm-gate prices to identify price determination method. By observing the tobacco industry as a whole one can obtain a clear picture of participant behaviour.

5. RESULTS AND DISCUSSION

Objective 1. Auction floor price determination

Sales at a tobacco auction floor is considered the most efficient and competitive by the Tobacco Association of Malawi (TAMA), the Tobacco Exporters Association of Malawi (TEAM) and the Tobacco Control Commission (TCC). However if this were the case one would expect the prices offered on the auction floor to fully reflect prevailing world tobacco prices. Tobacco dealers such as Limbe Leaf, Daimon, Stancom and African Leaf are the largest tobacco dealers in Malawi and are also active players in most of the tobacco markets world-wide. Production of burley tobacco is concentrated in the USA (35%) and Southern Africa, with Malawi accounting for almost 16% and Zimbabwe for 1% of the burley traded on the world market (Universal Leaf Tobacco, 1999). If the same buyers are operating in both Zimbabwe and Malawi, then both floors should be integrated because dealers have a prior knowledge of what each floor can supply in relation to their needs. One would therefore expect the same price trends in both Malawi and Zimbabwe.

If the prices paid for burley tobacco at the Malawi auction floors are a true reflection of regional prices, then one would expect a highly significant correlation between Malawi prices and the prices in the

nearest competitor, which in this case is Zimbabwe. The central question for empirical analysis of conduct is to test if the two prices are indeed correlated.

$$P_{Mal} = [P_{Zim}] \qquad (1)$$

Where: P_{Mal} = Tobacco price in Malawi

P_{Zim} = Tobacco price in Zimbabwe

Table 5.1 Correlation and regression test results for model Number one.

VAR	Coefficient	Constant	F	T	Correlation
P_{Zim}	0.557	72.58	17.4*	4.17*	0.828*

Data source: TAMA (1998b) and TIMB (1998)

NB: * = significant result

The correlation is significant at a 1% level, while the F-test and T-test at a 0.3% level. The high correlation between prices signifies that markets are integrated. This would support the presence of oligopsonistic competition within the market structure. If only the prevailing prices influence burley prices in Malawi, then surely prices should be exactly the same in both Zimbabwe and Malawi? However, Malawi prices differ slightly from Zimbabwean prices. Could there be other internal variables influencing prices in Malawi? A second question for empirical analysis is to test if indeed there are other local variables correlated with tobacco prices in Malawi?

$$Pt_{Mal} = [S_t, C_t, P(t-1)_{Mal}, Pt_{Zim}] \qquad (2)$$

Where: Pt_{Mal} = Burley price in Malawi at time t

S_t = Burley sold at time t

C_t = Cost of producing 1 kilogram burley at time t

$Pt\text{-}1_{Mal}$ = Burley price in Malawi at time t-1

Pt_{Zim} = Burley price in Zimbabwe at time t

From this model of price determination in Malawi, one would expect a priori: i) a positive relationship with volume of sales, ii) a positive relationship with the Zimbabwean price, iii) a negative relationship

with production costs and iv) a negative relationship with burley prices in the previous season.

A regression test of model two has been proven that both regional prices and local market conditions in Malawi influence prices at the auction floors in Malawi. All variables and the F-test were significant at a 5% level.

Table 5.2. Regression test results for model two

Variables	Co-efficient	T-test
S_t	8.06×10^{10}	5.887*
C_t	- 0.359	-3.400*
$Pt\text{-}1_{Mal}$	- 0.486	-3.765*
Pt_{Zim}	0.415	3.934*
F - Test = 18.15*		

Data Source: TAMA (1997a, 1998a, 1998b) and TIMB (1998)

NB: * = Significant result at a 5% level.

The positive relationship with Zimbabwean prices was explained in the previous model. The explanation for positive relationship with the volume sales is that cigarette manufacturers perceive Malawi burley to be the best cigarettes filler crop in the world, and given the low nicotine levels it can be blended into any cigarette, without influencing flavour to a large extent. As such there is a high demand for Malawi burley.

A high price in the previous season is the result of tobacco shortages or exceptionally high-grade tobacco in that season. Prices will often drop in the following season because growers tend to increase production at the expense of quality, in a bid to capture the previous price. Consequently, this larger, poor quality crop will earn a lower price. The negative relationship between price and production costs is explained by the tobacco quality. By improving production efficiency, one will inevitably lower production costs and enhance burley tobacco quality. The better quality crop fetches a higher price on the auction floor. The above test illustrates variables influencing prices at the auction floors. Quality is known to dictate prices offered by the dealers on the floor. If the growers had any significant market power, then surely the prices would rise as production cost do? This not being the case signifies that

growers have little influence on pricing. The supply variable further indicates the power of the dealer in being able to dictate prices for any burley grade sold. Bearing in mind the variables found to influence burley prices in Malawi, one must question why the prices at the Mzuzu Auction floor are not the same as those offered at Lilongwe and Limbe floors? Could the absence of a processing plant in Mzuzu and the necessity to transport all purchased tobacco to the nearest processing and packaging plant in Lilongwe influence pricing? Furthermore, would prices differ, given that the Mzuzu floors tend to open after and close before the Lilongwe and Limbe floors do? If operating times influence prices at Mzuzu floors, then one would expect a highly significant correlation, between floor prices, which changes with time. Lilongwe floor prices should effectively influence Mzuzu floor prices to a greater extent than Limbe, given that 50% of all tobacco is sold in Lilongwe. Four different correlation tests must be carried out in a bid to identify which floor has a greater influence on the Mzuzu prices:

$$MZP_{97} = [LLP_{97}] \quad (3)$$

Where: MZP_{97} = Mzuzu burley price in 1997
LLP_{97} = Lilongwe burley price in 1997

$$MZP_{98} = [LLP_{98}] \quad (4)$$

Where: MZP_{98} = Mzuzu burley prices in 1998
LLP_{98} = Lilongwe burley prices in 1998

$$MZP_{97} = [LIP_{97}] \quad (5)$$

Where: MZP_{97} = Mzuzu burley prices in 1997
LIP_{97} = Limbe burley prices in 1997

$$MZP_{98} = [LIP_{98}] \quad (6)$$

Where: MZP_{98} = Mzuzu burley prices in 1998
LIP_{98} = Limbe burley prices in 1998

Table 5.3. Correlation and regression test results for models three to six.

TEST	Model 3	Model 4	Model 5	Model 6
Correlation	0.792*	0.509*	0.7442*	0.6845*
F-test	33.82*	6.64*	24.8*	16.75*
T-test	5.816*	2.577*	4.98*	4.093*
Coefficient	0.78	0.74	0.79	0.996
Constant	22.63	37.52	26.42	9.65

Data source: TAMA, (1997b 1998c)

NB: * = Significant result at a 0.001 level.

The above results would support the theory that the prices at the Lilongwe floor have a greater influence on the Mzuzu floors, than the Limbe floors. Furthermore the tests prove true market integration exists between the floors. This is a common feature when the same buyers are operating on both floors. The reduction in the correlation values from 1997 to 1998 for Mzuzu and Lilongwe would indicate that the Lilongwe influence is declining with time. This decline is partly explained by the fact that opening and closing dates of the two floors is now differentiated to reflect differences in the growing season.

Given that tobacco purchased in Mzuzu is transported to Lilongwe for processing, one must question if indeed the transport cost is a factor in determining Mzuzu prices? This being the case, then the difference between Lilongwe and Mzuzu prices should be equal to the transportation cost? For both 1997 and 1998 season the Mzuzu prices were lower than those offered in Lilongwe. This difference ranges between 4 USCents per kilogram and 12 USCents per kilogram, with a mean of 10 USCent in 1998 and between 4 USCents per kilogram and 40 USCents per kilogram, with a mean of 15 USCent in 1997. These differences are similar to the cost of transporting tobacco from Mzuzu to the factories in Lilongwe. Of further significance is the additional 2 USCents per kilogram not accounted for each year. The consistency maybe related to dealers having to construct storage deports in Mzuzu and pay annual premiums.

One can conclude that the prices at the Mzuzu floors are lower than those in Lilongwe to an amount equivalent with the cost of transportation to Lilongwe, storage and other premiums. If one considers

that costs incurred by dealers have a greater effect on price then production costs; it becomes obvious that dealers have a greater market power than the growers. For power to exist, the dealers would have to collude in determining these expenses before purchasing bales. There is no actual proof, but the evidence may posit that a "gentleman's agreement" exists between buyers, regarding prices in Mzuzu.

Table 5.4 Transportation costs for one kilogram of tobacco from Mzuzu to Lilongwe.

DESCRIPTION	1998	1997
Transport cost per bale/km in Malawi Kwacha	0.60	0.60
Distance traveled	350.00	350.00
Transport cost per bale to Lilongwe (MK)	210.00	210.00
Cost per kilogram @ 100kg/bale (MK)	2.10	2.10
Exchange rate to US$1	25.04	15.29
Transportation cost /kg in US$	0.08	0.13
Mean difference between Mzuzu and Lilongwe prices	0.10	0.15
Storage and other premium expenses	0.02	0.02

Data source: Survey results

Objective 2: Tobacco dealer and auction floor behaviour

The previous section demonstrated that prices offered on the auction floor in Mzuzu are related to the prevailing regional prices, tobacco quality and to the costs incurred by dealers. If dealers are able to influence prices on the floors, then one must question the motivation behind those prices offered by the dealers.

The dealers interviewed claim that their customers (cigarette manufacturers) influence the prices prior to the marketing season. The manufacturers will approach all dealers individually, with tobacco supply contracts, in which, they specify the volumes required, the exact tobacco grades demanded and a fixed price they will pay per kilogram delivered to them. The dealers are than responsible for the purchase, processing, packaging and transporting of the target weight to the final destination. Larger manufacturers such as Phillip Morrision will spread out their order amongst all the dealers. This makes

good business sense, because relying on one dealer will put the manufacturer in a vulnerable position. Under this system dealers will not be in a position to demand higher prices from manufacturers. The limited number of manufacturers means that dealers are very competitive amongst themselves in securing contracts. The dealers go to great extremes to satisfy the manufacturers demands. A failure to meet contract specifications will result in the loss of contracts to other dealers. A good example is African Leafs' market share, which rose from 5% to 6% in 1997 and 1998 respectively at the expense of another dealer. The reason being, the latter had difficulty meeting with its target weight for a specific customer in 1998 (Personal communication at the auction floors).

The dependency on larger manufacturers for business viability is primarily because contracts from the smaller regional cigarette manufacturers cannot support the dealer production expenses. The huge overheads and large infrastructure investments observed in this industry can act as a barrier to entry for other smaller, less established dealers. Economies of scale will therefore play a major role in the dealer existence, which without the large contracts from these manufacturers faces a very real danger of closure.

If indeed the manufacturers are able to dictate prices to all the dealers then surely these dealers are able to manipulate sales on the floors to be sure that all demands are met for a particular manufacturer. The dealers will inevitably rush to complete their targets as soon as possible. In doing so dealers must bear in mind the capacity of their processing factory and their logistical ability to store and transport the tobacco. Most factories operate for only five months of the year, in which 10 000 kilograms per hour are processed for 24 hours a day. A dealer with this processing capacity cannot supply more than 43.2 million kilograms in any one season. As such the daily quota of tobacco purchased must fit the dealer's capacity, while meeting with contract specifications. Therefore within the first 4 to 8 weeks of tobacco sales prices tend to be on the increase until all dealers are satisfied that they can meet the required monthly quota for the remainder of the season (Sant'ana, 1999). At this time of the buying season oligopsonistic competition is at it's height on the floors.

If an oligopsony does exist, then the observed conduct of the dealers would depend on decision made by the dealer with the largest market share. Sant'ana (1999), found that i) Limbe leaf has a 53% market share, ii) Stancom has a 21% market share, iii) Daimon has a 20% market share and, iv) Africa Leaf with 6% market share. Limbe leaf is expected to make the choice on a bale before the others do, which will maximise their own profits, while considering there followers profit-maximisation problem. Likewise should Limbe leaf loose interest in a bale, then Stancom would take over the role of leader

and should Stancom stand down, then Daimon automatically takes up the role. For this behaviour to prevail, dealers must have prior knowledge of the volumes and prices that each dealer can reach. Limbe leaf should also be able to punish any dealer who raises prices to a level that would not maximise profits for Limbe leaf. The presence of these conditions would support the belief that a Stackleberg model exists with dealers.

It was previously shown that the manufacturers dictate prices and tend to spread out their orders to all dealers. This being the case, than it would be easy for Limbe leaf, and indeed any dealers to have prior knowledge of the estimated crop, processing capacities, the volumes to be purchased and the price which should be offered on the floors to ensure that all dealers can maximise profits, meet contracts and remain viable.

Behaviour on the auction floors depicts a Stackleberg model, where a large buyer is able to dictate prices at the level which is optimal to all other dealers. The auction floor sales team consisting of a leading price starter, followed by an auctioneer and a ticketter stand on the right of the bale in question. Facing the team are the buyers. The smallest buyer occupying the weakest position on the floor, in terms of the bidding process, faces the price starter. Following him is the largest buyers, who stand directly opposite the auctioneer and bringing up the rear are the remaining buyers in order of market share. By standing directly in front of the auctioneer the largest buyer occupies the strongest position and tends to make first bid on the desired bale of tobacco.

The smaller dealers rarely compete with Limbe leaf for a bale. Instead you find that every so often Limbe leaf would stand down and Stancom dominates bidding for that bale. The same facility was made for Daimon and Africa Leaf respectively. If one of the smaller dealer "stepped out of line", by pushing the price too high, the larger dealer would inevitably contact the manufacturers to complain, that prices were above acceptable levels. The manufacturer is in a position to threaten the culprit with the removal of their contract if prices are pulled to high. Prices can therefore be maintained at the favoured level.

The observations made at the auction floors indicate that the manufacturers can control all activities carried out by the dealers. Therefore in order to remain viable dealers must take each other into consideration. Quite often the largest dealer has the upper hand over the rest of the dealers. This conduct is related to the market structure, describing a Stackleberg model. Intrestingly enough, the same buyer position method is used on the Zimbabwean auction floors. However in this case there are

ten to fourteen dealers, so that the leader/follower model does not apply (Tobacco Sales Floor-Personal communication).

Objective 3: Farm gate pricing behaviour of intermediate buyers and estate owners

Farm level pricing for tenants is determined by TAMA. According to the representatives interviewed, the tenant prices are determined through annual farm budgets prepared at TAMA. These budgets take into account the tenant production costs, to come up with fair price that enables tenants to pay back the loans, while earning a sustainable income. If TAMA based prices only on the production costs and not the prevailing market price, then the tenant and estate markets are not integrated.

$$TP_t = [TC_t] \quad (7)$$

Where: TP_t = Tenant prices at time t

TC_t = Tenant cost of production as identified by TAMA

Model 7 has shown that tenant prices are closely related to the cost estimated by TAMA. Now, if tenant prices are related to the floor prices then one can conclude that the tenant and tobacco markets are integrated and TAMA pricing is competitive.

Table 5.5 Regression and correlation results for model seven

Variable	Coefficient	F-test	T-test
C_t	2.4×10^3	13.02*	3.602*

Data source: TAMA, (1998a)

NB: * = Significant result at 0.0226 level

$$TP_t = [P_t] \quad (8)$$

Where: TP_t = Tenant prices at time t

P_t = Burley prices at auction floors at time t

Table 5.6 Regression results for model eight

Variable	Coefficient	F-test	T-test
P_t	0.252	1.59	1.262

Data source: TAMA, (1998a and 1998b)

NB: * = significant result

The results in model eight illustrate that the tenant price is in no way related to the auction floor prices. This tells us that the markets are not integrated and pricing is controlled by TAMA for the estates to benefit at the expense of the tenants.

Several problems have been identified in the method being utilised to estimate these prices. The first being an under estimate for tenant production costs. The second common error is that of using a yield estimate of 1500 kilogram per hectare of tobacco. This value is unrealistic with the prevailing rise in the input costs and the ever-increasing problem of tobacco land degradation. A third error is a failure to appreciate that prices vary throughout Malawi. Table 5.3.3 compares the production cost estimates by TAMA and the survey for the 1999 season. Observations show the vast differences in projected costs.

If after paying back their loan, the tenant run at a loss, then surely their conduct would be to terminate tobacco production. Given that they do persist, then there must be other benefits, which keeps them motivated? The estate owner is responsible for supplying all the tenants' dietary and health requirements, so that tenant families are sure to be fed for 9 months of the year. Secondly, tenants illegally sell part of the tools, fertiliser and plastic sheeting provided by the estate owner to neighbouring farmers, whenever money is needed. Thirdly, by using family labour on his plot, the tenant is able to do casual work on other farms. Finally tenants sell the illegally tobacco they have produced to intermediate buyers, rather than to the estate owner. By doing so they can forgo their loan repayments to the estate owners.

If the tenant prices dictated by TAMA were fair, then tenants behaviour would be to focus all energy on producing the best possible crop, knowing that the final benefit is a fair reflection of their effort. Therefore the TAMA price regulations are promoting a tenant behaviour, which has a negative effect on the viability of tobacco estates.

Table 5.7 Cost estimates for 0.5ha of tobacco for the 1999 season according to TAMA and survey findings.

Description	Survey Est. (Mk)	Tama Est. (Mk)
Chemical Input	3175.86	3060.00
Tools	329.94	387.00
Labour	112.95	-
Maize	5599.79	3400.00
Barn Maintenance	973.22	320.00
Miscellaneous	-	1580.00
Total Cost	10191.76	8747.00
Est. Yield Kg/0.5ha	440.00	750.00
Gross Income	6587.33	10986.15
Profit	-3604.43	2239.15

Source: TAMA (1997b) and Survey results

The introduction of intermediate buyers into the tobacco market is meant to provide smallholders with an alternate channel through which to sell their tobacco. If smallholder tobacco growers sell on the auction floor than they can expect payment only in the month of May. The reasons are that the Mzuzu floor opens 2 to 4 weeks after the Lilongwe floor does and that once tobacco is sold, payment takes a further 2 weeks. The delay in the opening of the Mzuzu floors and in payments creates serious cash flow problems in the early post-harvesting period, compelling farmers to sell part of their crop to sustain themselves until the floors open and payment is followed through.

In the Northern Region there are fewer intermediate buyers, compared to the rest of Malawi. This is primarily a result of: i) there being few individuals who can afford the increased registration costs, ii) the remoteness of the tobacco areas, and iii) the controlled allocation of buying areas.

Rumphi district has two large firms buying tobacco within the same area. Both these firms have the capital to employ many buyers and to purchase large quantities of tobacco. The production shortfall in the 1999 seasons would surely, prompt these firms to compete against each other? Therefore if the intermediate buyer operates in a perfectly competitive market, then farm gate prices will change with

respect to the tobacco demands in the market. Observations carried out, found that prices fluctuated between MK20.70 and MK30.00 per kilogram of first grade tobacco. This meant that buyers were trying to out-bid each other, by offering higher prices. So does perfect competition exist?

The structure created by the Tobacco Control Commission means that only a few buyers operate within an area, at any one time. If this structure promoted competition between intermediate buyers, then prices throughout northern Malawi would reflect market demands for tobacco. However the observed price offered by most the intermediate buyers is exactly the same as the tenant price proposed by TAMA. Tenants are prepared to sell at this price because none of the money will be used to repay loans to estate owners, while smallholders are cash strung and have no other options. The expensive registration fees and the controlled buying areas imposed by TCC have effectively reduced the number of buyers, so killing competition at this level of the market.

Objective 4: Behaviour of tobacco growers

The market structure of tobacco has encouraged farmers to participate in the production and marketing of tobacco. This is evident for the rapid increase in growers over the past five years (Msiska, 1998). What are the factors affecting this change in the number of growers? Could the tobacco/maize price ratio, the previous season cost of production and the number of growers already operating induce a change?

$$[GN_t - GN_{t-1}] = [P(t/m)_t, C_{t-1}, GN_{t-1}] \qquad (9)$$

Where: GN_t = Grower number at time t

GN_{t-1} = Grower number at time t-1

Pt/m_t = Price ration of tobacco and maize

C_{t-1} = Production cost at time t

GN_{t-1} = Grower number at time t-1

The change in the number of growers has i) a positive relationship to price ratio, ii) a positive relationship to production costs in the previous season, and iii) a negative relationship to the number of growers in the previous season. Testing of this model proved otherwise as none of these variables had a significant relationship with the changes in grower numbers. The insignificance of previous grower numbers maybe attributed a data collection error on the part of the Tobacco Control Commission (TCC), who maybe registering the number of clubs and estates growing tobacco, rather than the actual number of growers involved.

Table 5.8 Results for the regression test on model nine

Variables	Coefficient	T-test
GN_{t-1}	- 0.30	-1.36
C_{t-1}	3.26	2.599
Pt/m_t	855.80	0.286
F-test = 2.3		

Data source: TAMA, (1998a, 1998b)

NB: * = significant result

The failure of model eight means that one must reconsider the factors influencing grower numbers. If the tobacco prices offered on the auction floors are favourable, then more growers will produce tobacco in the hope of capitalising from these prices.

$$[GN_t - GN_{t-1}] = [P_t] \qquad (10)$$

Where: GN_t = Grower number at time t

GN_{t-1} = Grower number at time t

P_t = Burley price at the auction floor

Model ten failed the regression test, with a T-test value of 0.266. Therefore the prevailing floor price has no significance on the change in grower numbers.

The failures of the above tests prove that there are other factors that must be influencing farmers to grow tobacco. In recent years the state and developing organisations have been promoting tobacco production at the smallholder level. Liberalisation of tobacco production saw extensive development work being carried out to provide services such as input loans, transportation, auction floor access and extension training to potential smallholder tobacco growers. Could the previous legislation and absence of these services have limited growers? If legislation and access to the above services limited tobacco production, then liberalisation and the provision of these services would surely encourage farmers to grow tobacco. Statistics compiled by Msiska (1998), found that the number of growers increased substantially after liberalisation of tobacco production. Furthermore the survey revealed that all smallholders rely on the provision of production and marketing services by the state and by

organisations such as AHL, NASFAM, ARET and TAMA. Smallholder indicated that in the absence of these organisations, they would not be able to grow tobacco profitably. Unfortunately there is insufficient data available to test the extent to which these incentives are encouraging more farmers to grow tobacco.

Objective 5: Effects of institutional activity on the conduct of growers and buyers.

Through-out this entire chapter it has been shown that the conduct of all the players in the tobacco chain is closely related to the conduct of the various organisations or lobby groups set up to protect the interest of various parties. These organizations include TAMA, NASFAM, TCC, TEAM and MRFC.

5.1. Impact of TAMA on growers and buyers

TAMA is the largest growers association, consisting mainly of influential estate owners. Is TAMA influential enough to change national policies? If TAMA is a strong lobbying power, then it's conduct should promote policies that favour estate growers.

The first major impact by TAMA is in depressing the formation of a tenant association. By so doing, TAMA ensures that tenants remain powerless against exploitations by the estate owners. Secondly TAMA has prompted the TCC to introduce laws that will limit the number of intermediate buyers. The increased cost of registration and the allocation of buying areas have significantly reduced the number of buyers. As a result tenants have no choice but to sell to estate owners. Finally TAMA is still able to dictate tenant prices in a liberalised tobacco market. This contradiction of the national tobacco policy leaves tenants at a disadvantage, prompting the behaviour described earlier.

One can therefore consider TAMA□s conduct to be one that favours members Furthermore it is able to influence the behaviour of tenants and intermediate buyers.

5.2. Impact of NASFAM on the conduct of smallholders

NASFAM is another grower association, which provides loan, input, transport and extension services for smallholder tobacco producers. Would these smallholders exist in the absence of NASFAM? NASFAM is empowering the smallholder by focusing on their production and marketing needs. Results from the survey show that higher tobacco yields of 1108 kilogram per hectare are obtained by smallholders compared to the 1071 kilogram per hectare realised by estates. Furthermore the high grade smallholder tobacco fetches a better price on the auction floor than that of estates.

The facilities created through NASFAM have contributed significantly to the conduct of smallholders. Where as in the past these farmers earned minimal incomes from maize, they can now earn substantially higher incomes from tobacco production and sales. The more successful NASFAM becomes, the greater the number of smallholders who will turn to tobacco as a cash crop. The activities carried out by NASFAM have had a positive effect on the income levels of many farmers and on the weight of burley tobacco realised in Malawi.

5.3. Impact of TEAM on the conduct of dealers.

The Tobacco Exporters Association of Malawi (TEAM) is the major marketing body, representing the dealers, processors and exporters. There is no direct indication that TEAM has any direct influence on tobacco prices and volumes in Malawi. Still, if the tobacco dealers practise a Stackleberg model, then they must be in a position to maintain a market structure that will support this model.

Could TEAM be the tool they use? Data collected by TEAM will indicate projected export earnings and volumes, dealer capacities and potential export markets. This data give dealers the necessary information about each others projected market share enabling them to organise their daily buying quotas on the floors. With this data each dealer can accommodate the others needs. In so doing, a Stackleberg model can be supported.

One can therefore say that TEAM is the instrument used by dealers to obtain data on the Malawi burley tobacco market. Usingthis data enables them to ensure manufacturer demands can be met by all dealers.

5.4. Impact of lending institutions on the conduct of growers and intermediate buyers.

The principle lending institutions in Malawi are the National Bank, Commercial Bank of Malawi, MRFC and ADMARC. The two banks finance estates and intermediate buyers, ADMARC and MRFC provide input loans to all growers Interest charges range from 49% to 52%, depending on the clients collateral and reputation. All require that clients place a guarantee of 15% to 40% of the loan, in order to secure a loan.

The MRFC is one of the largest loan institutions in the region and they service a largest proportion of tobacco growers. Both the small-holders and the estates. The 1996, 1997 and 1998 seasons saw MRFC issuing total loans around the value of MK40 million, while in the 1999 season the total exceeds MK160 million. This could possibly be a result of the higher input costs experienced as a result of the

Malawi Kwachas' devaluation last year and the substantial increase in loan applicants in 1999. The number of tobacco clubs on loan seems to be increasing from 20% in 1995 to 55% in 1999.

Estates on the other hand have decreased by 35% in the last 5 years. This trend maybe as a result of the higher number of overdue loans from the estate sector than the clubs. In fact the MRFC feels this group is a lower risk. This is because they offer social collateral, that is if one member does not pay, then the whole group is affected. As such the other members should put pressure on the offender to pay on time. This appears to be working for MRFC and the clubs.

The number of clubs have increased substancially as a result of the MRFC offering club loans. This has contributed significantly to the increase in growers and prompted smallholder to only sell to intermediate buyers for consumption purposes. The estates have developed a bad reputation with lending institutions, who now screen them carefully. The limited credit has prompted estate owners to reduce production and take up intemediate buying. The abscence of a loan facility for intermediate buyers, means that they are unable to offer higher prices and ensure that their tobacco is properly cured, graded and baled.

5.5. Impact of TCC on growers and intermediate buyers.

The TCC was initially set up as a controlling body, for tobacco production and marketing. It is responsible for the issuing of grower registration certificates and intermediate buyer permits. These allow the above groups to sell directly at the auction floors. They issue out quotas' for both the growers and the intermediary buyers. Producers pay US$10.00 for their registration, while intermediate buyers pay MK2.00 per kilogram for a minimum of 1.5TONS of tobacco. Buyers can purchase as large a quota that they can afford, yet are limited to only one licence.

The high cost for intermediate buyer licences and the zoning of buying areas have subsequently reduced the number of buyers. As such the market is not competitive and farmgate prices remain low. Thus growers must rely on a few buyers to sell their tobacco, thus facing the chance of exploitation by these buyers.

The failure by TCC to recognise tenants as growers has effectively placed them at the mercy of the estate owner. No tenant organization exists to "keep check" of their needs and problems. As such TCC accepts the TAMA tenant prices without questioning the effects they on growers and tobacco production.

Regarding sales the law states that all Malawian tobacco must be sold on the auction floors in the form of tobacco bales of 60 kilogram to 100 kilogram in weight. No farmer or intermediate buyer may sell directly to the large tobacco dealers. This creates a barrier in that farmers can only sell bales to floors and if they wish to sell a small quantity it must be to the intermediate buyer. Dealers however are allowed to purchase foreign tobacco, and bring it into Malawi for processing in the local factories. As such many intermediate buyers, smuggle tobacco into Tanzania and Zambia, where they sell to the dealer representatives there, rather than on the floors.

6. CONCLUSION, POLICY RECOMMENDATIONS AND AREAS OF FURTHER STUDY

This study demonstrated the behaviour of the tobacco market participants, concentrating on the factors determining prices, the factors encouraging tobacco growers and the conduct of institutions that have formed over time to facilitate the production and marketing of tobacco.

6.1 Auction floor price determination

The correlation between prices in Malawi and in Zimbabwe indicates market integration, probably as a result of the same dealers operating on both floors. Differences between their respective prices are attributed to internal variables, these being sales volumes, cost of production, and prices in the previous season. All the variables identified can be associated to tobacco quality. Therefore quality could dictate prices offered by the dealers on the floor. If the growers had any significant market power, then surely the prices would rise as production cost do? This not being the case signifies that growers have little influence on pricing. The supply variable further indicates the power of the dealer in being able to dictate prices for any burley grade sold.

Tests carried out found that prices at the Lilongwe and Mzuzu floors are closely correlated. This market integration is expected as the same buyers are operating on both floors. The reduction in the correlation from 1997 to 1998 for Mzuzu and Lilongwe is partly explained by the fact that opening and closing dates of the two floors is now differentiated to reflect differences in the growing season.
Differences between the floor prices are equivalent to the cost of transporting tobacco to the processing floors in Lilongwe, plus storage and premium expenses incurred in Mzuzu by the dealers. Given that costs incurred by dealers have a greater effect on price than production costs, it becomes obvious that dealers have a greater market power than the growers. For such power to exist, the dealers would have to collude in determining these expenses before purchasing bales.

6.2 Dealer and auction floor behaviour

The dealers claim that their customers (cigarette manufacturers) influence the prices prior to the marketing season. This is evident by the fact that manufacturers dictate a final price to be paid. Tobacco orders are spread out amongst all dealers, to ensure that the manufacturer can keep prices at a level that maximises profits for themselves. If indeed the manufacturers are able to dictate prices to all the dealers then the dealers have to manipulate sales on the floors to be sure that all demands are met for a particular manufacturer. Using TEAM data on projected export earnings and volumes, dealer capacities and potential export markets, the dealers have information about each others projected market share, thus enabling them to organise their daily buying quotas on the floors.

The fundamental questions for Malawi are whether AHL is a free competitive sales market and does the conduct of the dealers depend on decision made by the dealer with the largest market share. Limbe leaf in this case does make the choice on a bale before the others do, thus maximizing its own profits, while considering followers' profit-maximisation problem. By using the manufacturer, Limbe leaf is further able to punish any dealer who raises prices to a level that would not maximise profits for Limbe leaf. The observations made at the auction floors indicate that the manufacturers can control all activities carried out by the dealers. Therefore in order to remain viable dealers must take each other into consideration. Quite often the largest dealer has the upper hand over the rest of the dealers. This conduct is related to the market structure, describing a Stackleberg model.

6.3 Farm-gate pricing and buyer behaviour

The farm level pricing for tenants determined by TAMA is based on the tenant production costs, and has no relation the prevailing market price. The tenant and estate markets are therefore not integrated. Cost estimates are too low and the expected yields far exceed the real tenant output. The TAMA prices do not reflect market conditions, favouring estate owners. Since the tenant prices are low, tenants tend to focus all their energy on other activities rather than on production. As such quality is poor. The end result is lower prices for the estates themselves.

6.4 Grower Behaviour

No conclusive evidence was identified to be the major factor influencing the behaviour of tobacco growers. The existance of tobacco promotional organizations may play a significant role.

6.5 Tobacco institutions behaviour

The influence of TAMA on the buyer regulations and prices has prevented free competition to persist amongst the tenants and the intermediate buyers, thereby affecting their behaviour. Similarly NASFAM has been found to influence the behaviour of many farmers. Their services have encouraged many a maize grower to turn towards tobacco as a cash crop. The success of their conduct can be measured by the fact that smallholder tobacco yields are greater and their quality is superior to that of estates. MRFC has facilitated the growth and participation of small-holders through the provision of loans for tobacco production.

TEAM has provided a means by which dealers can gain knowledge of each others needs and price limitations. TCC has implemented regulations that reduce competition on the auction floor and at the farm-gate level. The tobacco quota system limits the amount of tobacco one can buy or sell, thus preventing a free competition at all levels of the market.

6.6 Policy recommendations

If the oligopsonistic competition at the dealer and manufacturer stage is to be eliminated, then policies the promote competition must be considered. some suggestions include: i) income tax exemptions for the first five years of production, ii) export tax exemption for the first five years of production, iii) reduced import duties for factory machinery purchased in the first year, and iv) relax laws limiting the amount of cash a foreign firm can return to their place of origin.

The present quota system and high licence costs act as barriers to entry at the buyer and dealer stages. Such barriers should be revised to promote investment into these sectors, rather than limiting participation. This is most significant at the intermediate buyer level, where the new licence cost and the buying zone limitations have effectively reduced the number of buyers and consequently reduced competition. This in turn promotes low farm-gate prices and unrealistic returns to intermediate buyers.

TCC needs to review the tenant pricing system. The current method used to determine the tenant prices is biased towards the estates. TAMAs failure to consider the inflation rates, the transportation limitations and the overall management requirements for estates and tenants has resulted in unrealistic prices for tenants. The negative incomes after sales have resulted in the tenants illegally selling tobacco to intermediate buyers to escape repayment of debt to estates. The price setting by TAMA does not conform to the theory of tobacco market liberalization. Instead the role of TAMA should be that of a facilitator, assisting estate owners and tenants in deciding on a farm-gate price that reflects market

demands. If the estate offers a price above that of buyers, then tenants will be more enthusiastic to produce high quality tobacco.

6.7 Suggestions for further research

A follow-up study should be carried out to determine the efficiency of the auction system in other countries. Furthermore it should assess the regulations used to promote competition and discourage collusion between dealers on the floors.

There is no evidence showing the factors that influence farmers to grow tobacco. It would be important to carry out a study to identify the factors influencing the number of tobacco growers and to what extent the current liberalisation of tobacco has prompted tobacco production.

6.8 Conclusion

This study has demonstrated that the conduct of the participants in the Malawi tobacco industry chain is closely related to the existing oligopsonistic structure. The dealers tend to follow a leader/follower behaviour on the floors, the prices are determined by the dealers on the floors and by the estate owners and buyers at the farm-gate. Finally the tobacco institutions are geared towards promoting their member interests, to an extent where they can influence other participants actions.

The findings suggest promoting policies that will encourage competition at the dealer and manufacturer stages, while empowering the growers and intermediate buyers.

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